



FLOOD RISK STATEMENT

MB018 NEWELLS, LETCHWORTH

Client: Settle Group

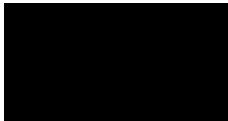
Job no: MB018

Revision: 01

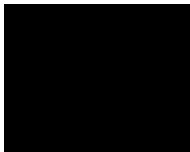
Date: 06th September 2024

Revision	Date issued	Description
00	23/04/2024	First issue
01	03/09/2024	Updated to suit LLFA comments

Document review and verification (current issue)



Author
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Reviewed and Approved by
Jim Rudd

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1. INTRODUCTION

SPD Studio has been appointed by Marfleet and Blyth to undertake a Flood Risk Statement for a new residential development proposed on land adjacent to 3-5 Newalls, Letchworth, North Hertfordshire.

This report has been prepared to support a full planning application to develop the existing site and provide a 15 unit, three-storey residential building with a cycle store on the ground floor, 26 parking spaces (including one disabled bay), landscaping and supporting infrastructure.

The site is situated entirely within Flood Zone 1 with a total site boundary of 0.19ha. As such, a formal site-specific flood risk assessment is not required, however the principles outlined within the National Planning Policy Framework (NPPF), North Hertfordshire's SFRA and accompanying web-based planning policy guidance, including DeFRA Schedule 3 will continue to be adopted.

The NPPF was first published in March 2012 and later updated in December 2023 by the Department for Communities & Local Government (now referred to as the Ministry of Housing, Communities and Local Government), and is now considered the standard for Flood Risk and Surface Water Management.

This report will follow guidance withing DeFRA's Schedule 3 The Flood and Water Management Act 2010, which has now been legally implemented in 2024.

This report aims to demonstrate to the Local Planning Authority and Statutory Consultees that the existing site can be successfully developed whilst adhering to the requirements of the NPPF and North Hertfordshire District Council SFRA. Supporting evidence will be presented in the following sections of this report so to allow the planning application to be considered in terms of flood risk and surface water disposal.

Should additional detailed information be required with regards to flood risk and surface water disposal, it is anticipated that appropriate planning conditions will be recommended for future consideration.

2. EXISTING SITE PARAMETERS

2.1 SITE LOCATION

The proposed development lies adjacent to Newells, Letchworth. The nearest postcode is SG6 2PT, grid reference TL 523672 232038.

The site is bound by private allotments to the north, Pryor Way (with green space) to the east, Newells to the south and private dwellings to the west. The application site boundary comprises an area of approximately 0.19 hectares and is developed brownfield land, as shown by Figures 1 and 2:

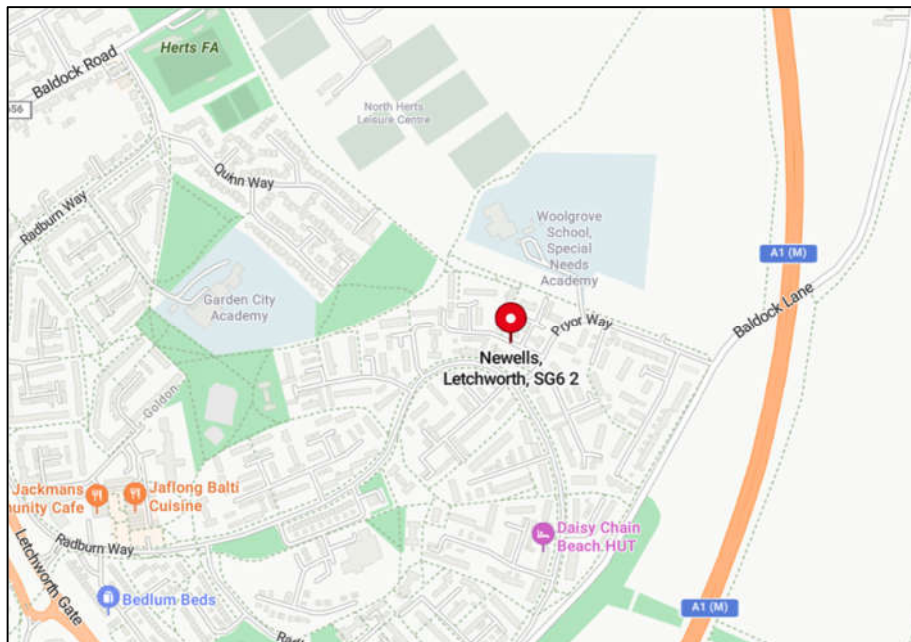


Figure 1- Site location



Figure 2- Aerial Site Imagery

2.2 SITE GEOLOGY

The British Geological Survey map records show the site has a bedrock formation geology of Holywell Nodular Chalk Formation throughout, with missing data on just the superficial deposits to the north east of the site. This suggests that infiltration techniques could be possible and will be explored, providing any soakaways are sufficient distances away from major structures on and off site. An extract from the map can be seen on Figure 3.

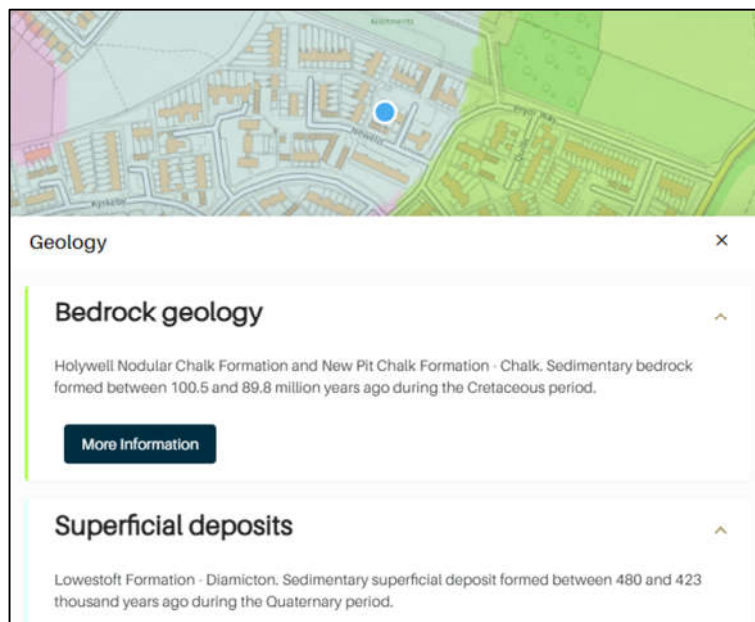


Figure 3- British Geological Survey Map Extract

2.3 HYDROGEOLOGY

The site is also located in a designated Source Protection Zone 1 and 2 . Therefore, it is classified as having high risk of groundwater vulnerability. Due to the severity, infiltration methods will likely not be applied for this site. It is recommended to have lined systems to prevent any surface water contaminants entering the protection zone.

2.4 SUDS FEASIBILITY

Surface water drainage is proposed to be managed on site using SuDS. An assessment has been carried out adopting the North Hertfordshire District Council SFRA SuDS hierarchy, shown in the below table.

SuDS Technique		Feasible	Explanation
1	Rainwater harvesting or blue roofs for irrigation	✓	Green/blue roof will be implemented in the proposed design.
2	Infiltration techniques	✗	There is no potential to use infiltration techniques due to space constraints on site. Not feasible to place infiltration devices 5m away from buildings, foundations or roads. Additionally the site sits in a Source Protection Zone.
3	Attenuation through green infrastructure	✗	There is no potential to provide green landscaping due to the size and shape.
4	Discharge direct to a watercourse	✗	There is no watercourse in the vicinity of the site.
5	Discharge to surface water sewer or drain	✓	It is proposed to discharge surface water from the redevelopment site to a public surface water sewer in Newells road.
6	Discharge to combined sewer	✗	There are no combined sewers within the vicinity of the site.

2.5 EXISTING PUBLIC SEWER ASSETS

The public sewer asset record plans obtained for the local area from Anglian Water confirms that there are both surface and foul water sewers within the vicinity of the site. Therefore, as there is no watercourse nearby or availability to infiltrate, it is likely that the surface and foul water will be discharged to the public sewers.

3. FLOOD RISK

3.1 TIDAL + FLUVIAL FLOODING

The Environment Agency's indicative flood plain mapping indicates that the site is not deemed to be situated within the undefended flood plain of any nearby designated main river, watercourse or tidal estuary, as illustrated in Figure 4.

The site is therefore classified as being within Flood Zone 1, which is defined as land having a low probability of tidal or fluvial flooding (less than 0.1% annual probability).

The NPPF's Planning Practice Guidance (Flood Risk Vulnerability and Flood Zone Incompatibility) classifies buildings used for dwelling houses as 'more vulnerable' land-class usage in term of flood risk. Therefore, in accordance with NPPF Annex 3: Flood Risk Vulnerability Classification, the site is considered appropriate for development.

Consequently, the development site satisfies the requirements of the Sequential Test, which requires potential developments to prioritise land located within areas of low flood risk in the first instance.

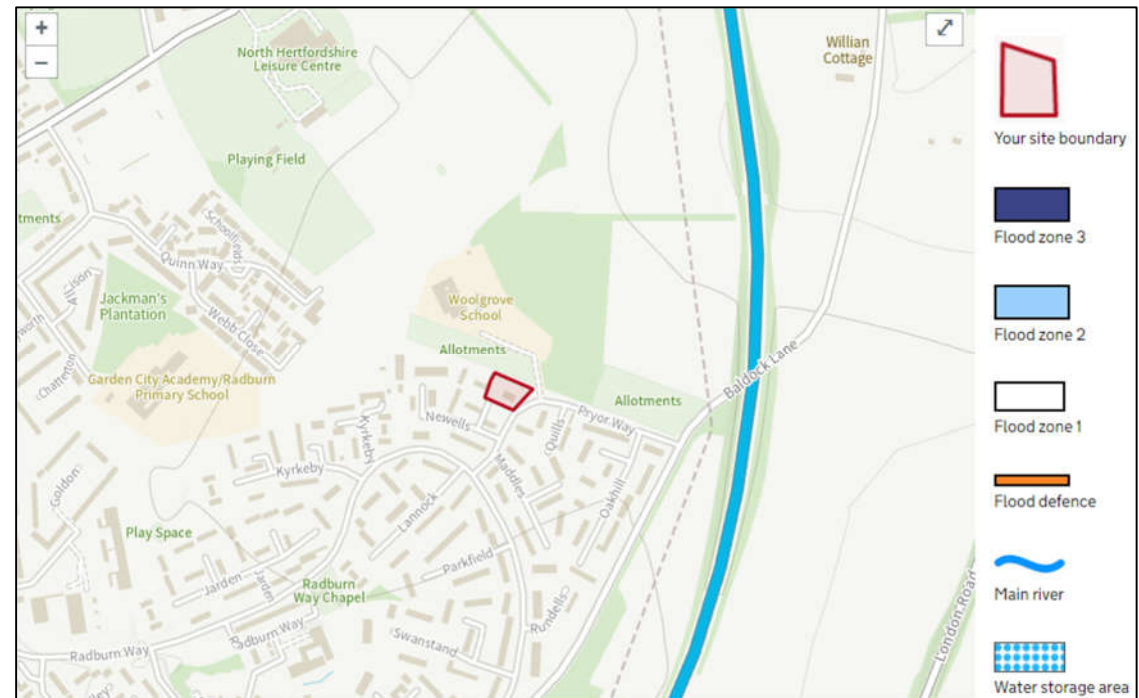


Figure 4- Flood Zone Map

3.2 OTHER POTENTIAL SOURCES OF FLOODING

A further consultation of Environment Agency indicative flood map records shows that for surface water the site appears to have a minimal area of low risk to surface water (flooding for the low 1:100-year scenario) within the existing paved garaged area. This is shown illustrated in Figure 5.

As it appears the highway is acting as a surface water conveyance route, proposed finished floor levels to dwellings should adhere to normal good practice and be raised above existing ground levels, with external finishes designed to fall away from buildings. This should minimise the risk of minor localised ponding or overland surface flows from encroaching into proposed buildings.

Environment Agency records also confirm that the site is not shown to be affected by flooding as a result of rivers and sea or breach of a nearby reservoirs, as can be seen in figures 6 and 7.

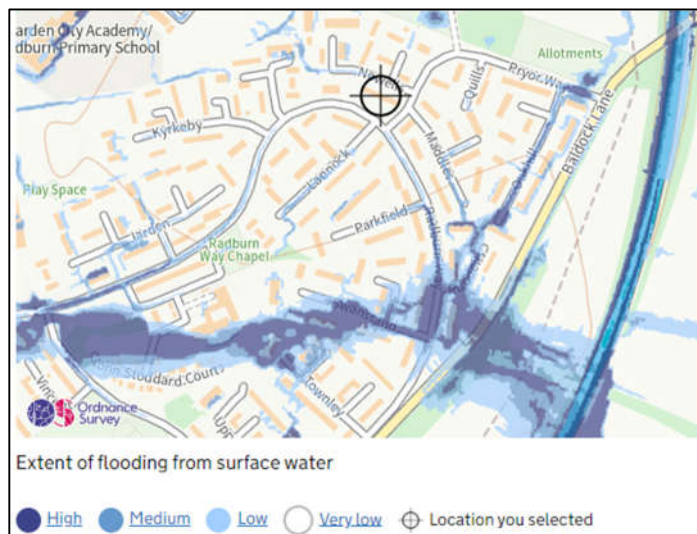


Figure 5- Flooding Risk from Surface Water

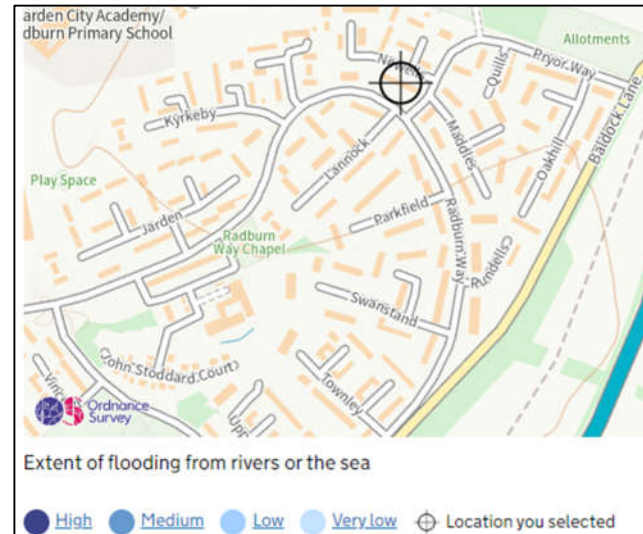


Figure 6- Flooding Risk from Rivers and Sea

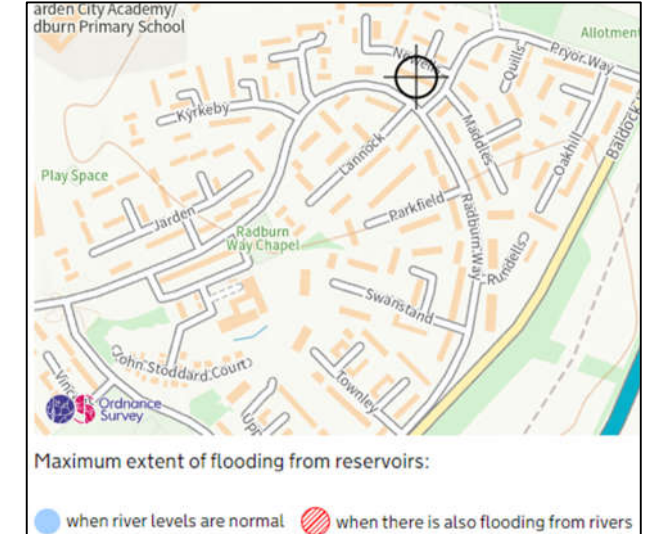


Figure 7- Flooding Risk from Reservoirs

4. SURFACE WATER DRAINAGE STRATEGY

4.1 DEVELOPMENT PROPOSALS

A full planning application is to be submitted to the local planning authority at North Hertfordshire District Council, which seeks permission to develop the brownfield site and construct three floors of new residential flats providing 15 units with associated parking.

A layout for the proposed site has been prepared by SPD Studio Ltd which outlines the proposals, as illustrated in Figure 8.

A detailed version of the proposed site layout plan has been provided within Appendix B of this report for further reference.

4.2 PRE-DEVELOPMENT DISCHARGE RATES

The application site is brownfield and comprises an area of 0.19ha, with the development area outside of proposed highway works being 0.15ha. The sites greenfield runoff rate has been calculated using Causeway Flow to generate a peak surface water run-off rate of 0.3l/s for the 1:1 rainfall event as illustrated in Figure 9. Due to the low discharge rate, generally anything below 1 l/s requires an outlet diameter less than 50mm, which is susceptible to blockage risk as per CIRIA guidance. Due to this it is seen that the minimum safe discharge rate will be set to 1 l/s for the site.

It is therefore concluded that the proposed site will look into discharging at a similar rate to the existing greenfield conditions of 1l/s for a 1:100 year storm plus 40% climate change.



Figure 8 - Development Site Area

Pre-development discharge

Site Makeup: Greenfield

Greenfield Method: IH124

Positively Drained Area (ha): 0.150

SAAR (mm): 593

Soil Index: 3

SPR: 0.37

Region: 5

Betterment (%): 0

Calc

QBar (l/s): 0.4

Return Period (years)	Growth Factor	Q (l/s)
1	0.87	0.3
30	2.55	0.9
100	3.56	1.3

Figure 9- Existing Greenfield Run-off Rate

4.3 POST DEVELOPMENT CATCHMENT AREAS + RUN-OFF RATES

A total post-development developable impermeable area of 1,090m² has been calculated based on the proposed site layout, comprising roof areas, access roads and parking provisions. It is understood that the two areas of proposed highway parking extensions will be excluded from the SuDS calculation as it is understood this will be maintained by the local highway authority and therefore will form it's own separate drainage as part of a future S278 application. Therefore the SuDS calculations will exclude these areas (combined at 307m²) leaving a total calculation area of 783m².

An urban creep allowance has not been applied to this development due to the footprint of the building in relation to the boundary, also as its use being for residential flats, expansion is not foreseen.

4.4 ATTENUATION PROVISION

The surface water drainage strategy for the development will adopt appropriate forms of sustainable drainage systems (SuDS) to comply with the requirements of the NPPF, North Hertfordshire District Council SFRA and Schedule 3 to ensure that post-development surface water flood volumes are managed on-site in a sustainable manner.

Attenuation will be provided within the application site in order to manage the calculated peak run-off volumes required during rainfall events up to and including the 1:100-year + 40% climate change allowance in accordance with the Environment Agency's peak rainfall allowance guidance for sites within the Upper and Bedford Ouse Management Catchment, as shown by Figure 10.



A preliminary assessment of the required attenuation provision for the development has been carried out based on the parameters outlined above, using the Causeway Flow hydraulic simulation software. The simulation results indicate that between 89m³ and 121m³ of storage will be required to manage the peak 1:100-year (including 40% climate change allowance) run-off volume generated by the development based on restricting discharge from the site to the Q1:1 year greenfield run-off rate, as shown in Figure 11.

This calculation is an initial estimate of the required attenuation volume at this stage and has been assessed in more detail in later sections of this report which includes detailed hydraulic modelling of the SuDS/Surface Water Drainage Strategy.

A Surface Water Drainage Strategy incorporating sustainable drainage systems (SuDS), has been prepared for the purposes of this assessment and to demonstrate how surface water run-off from the proposed development will be effectively managed and disposed of whilst simultaneously reducing the risk of flooding.

The key principles of the proposed surface water drainage strategy for the development are summarised as follows:

- Post-development surface water run-off will be restricted to 1 l/s for all storm events up to and including the 1:100-year event (inclusive of a 40% climate change).
- Surface water will be collected from the roof areas, and blue/green roof, which will flow towards the parking area where it will be stored in permeable paving. It will then be restricted by a flow control system.
- Due to site restrictions and allowing sufficient access for wheelchair users on footpaths, there are no available reasonable area to provide further SuDS features without removing further green spaces.
- Surface water will be discharged from the site to the existing Anglian Water assets to the south of the site.
- Hydraulic modelling of the network demonstrates that the strategic network is capable of withstanding the 1:100-year peak rainfall event, inclusive of an additional 40% climate change allowance.

Storage Estimate	
Return Period (years)	100
Climate Change (%)	40
Impermeable Area (ha)	0.150
Peak Discharge (l/s)	1.000
Infiltration Coefficient (m/hr) (leave blank if no infiltration)	
Required Storage (m ³)	Calc
from	89
to	121

Figure 11- Quick Storage Estimate

- The private parking area will be constructed using a lined permeable paving system to provide treatment at source before being conveyed to the strategic network.

The surface water drainage strategy drawing 'MB018-E-300' has been included within Appendix C, and the detailed surface water network hydraulic simulation results have been provided within Appendix D of this report for reference.

The following series of tables outline the water quality assessment in accordance with CIRIA SuDS Manual 753. A commercial scheme comprising of office space would fall within the low pollution hazard indices, as outlined in table 26.2, Chapter 26 of the CIRIA SuDS Manual 753. The table below shows this table:

Land-use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (e.g. cul-de-sacs, home zones and general access roads) and non-residential car parking with infrequent change (e.g. schools, offices) i.e. < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (e.g. hospitals, retail), all roads except low traffic roads and trunk roads/motorways	Medium	0.7	0.6	0.7
Sites with heavy pollution (e.g. haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways	High	0.8	0.8	0.9

Table 1- Pollution Hazard Indices for Different Land-use Classifications

Type of SuDS component	Mitigation indices		
	TSS	Metals	Hydrocarbons
Filter strip	0.4	0.4	0.5
Filter drain	0.4	0.4	0.4
Swale	0.5	0.6	0.6
Bio retention system	0.8	0.8	0.8
Permeable Pavement	0.7	0.6	0.7
Detention Basin	0.5	0.5	0.6
Pond	0.7	0.7	0.5
Wetland	0.8	0.8	0.8
Downstream Defender (Proprietary Treatment System*)	0.5	0.4	0.8
*Proprietary treatment systems	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1-year return period event, for inflow concentrations relevant to the contributing drainage area.		

Table 2- Indicative SuDS Mitigation Indices

Source	TSS	Required mitigation indices	
		Metals	Hydro-carbons
Residential Roof	0.2	0.2	0.05
Residential Car Parks	0.5	0.4	0.4
Mitigation Indices			
Permeable Pavement (Mitigation index ₁)	0.7	0.6	0.7
Proprietary Treatment System Blue/Green Roof Podium	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1-year return period event, for inflow concentrations relevant to the contributing drainage area.		
Total Performance	0.7	0.6	0.7
Check	Criteria Matched	Criteria Matched	Criteria Exceeded

Table 3- Indicative SuDS Mitigation Criteria Assessment

The above tables 1-3 conclude that the proposed SuDS features provided in the drainage strategy satisfy the water quality treatment criteria for the type and size of the application site in accordance with CIRIA SuDS Manual 753. It has been noted that there is no CIRIA reference for blue/green roofs in the mitigation section of the manual, where there would be additional water quality benefits from these devices.

To ensure that the system is regularly and appropriately managed and maintained, it is anticipated that the external drainage systems will be placed under a formal agreement with an independent Maintenance Company to carry out periodic inspections and any necessary remediation/maintenance works, thus safeguarding the long-term operational performance of the proposed drainage system and SuDS components within the development.

It is anticipated that a formal Maintenance & Management Plan/Statement will be required to protect the longevity of the scheme's drainage infrastructure and it is recommended that a planning condition is assigned to the Decision Notice/planning permission to fulfil these criteria.

5. FOUL WATER DRAINAGE STRATEGY

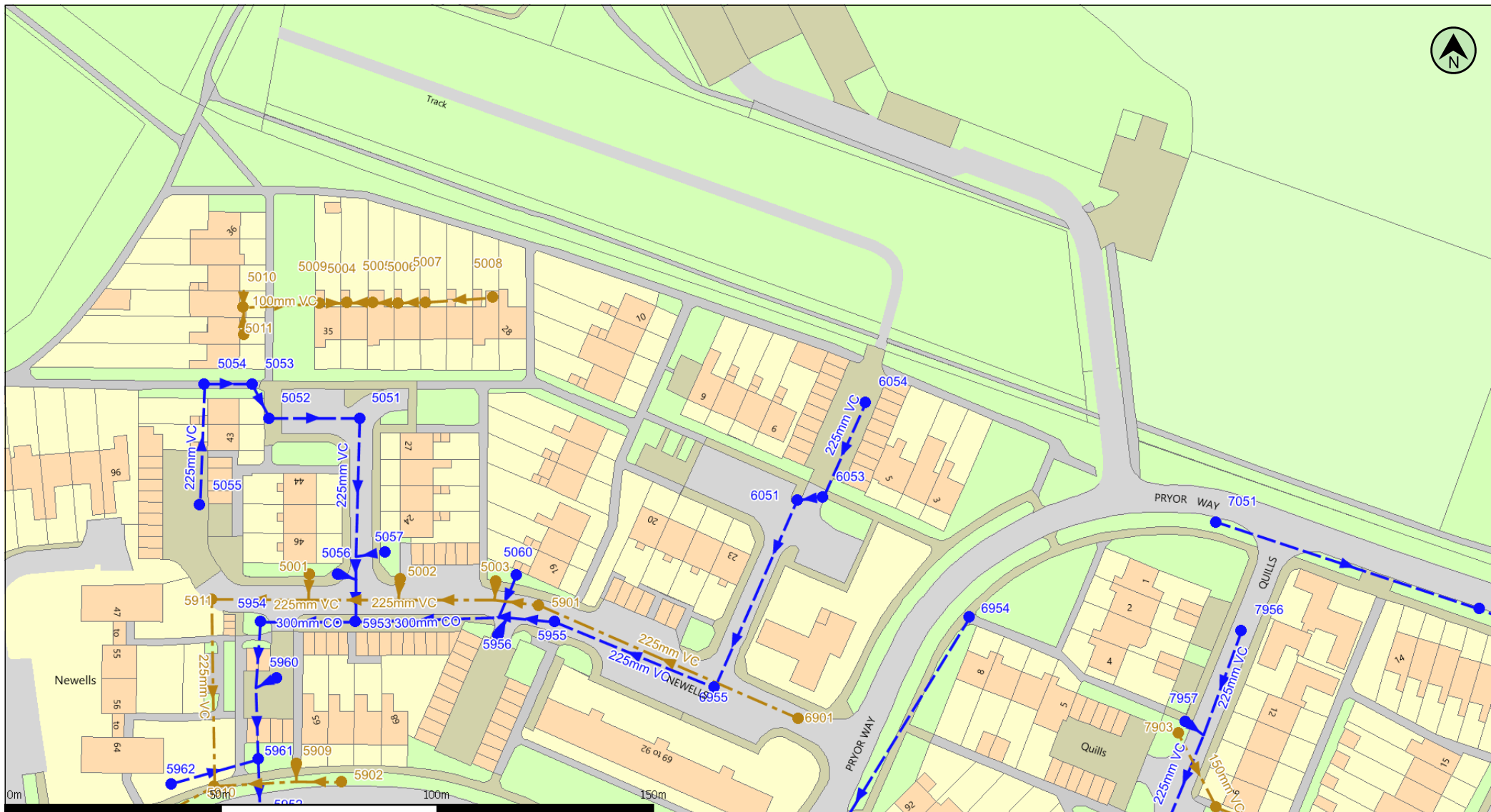
The public sewer records for the local area have been obtained from the Statutory Sewerage Undertaker for the region (Anglian Water) which indicate that there is an existing foul water sewer network present within the vicinity of the site.

Although the existing site uses a private foul connection which travels west from the site, it is deemed not suitable to discharge via this route. The proposed developments total foul discharge will require a 150mm diameter pipe, where the existing connection is a 100mm. Therefore, unless the whole private network is upgraded and traced for adoptable connection, it's expected this method will not be suitable.

It is anticipated that foul water flows from the proposed development will be collected in the parking area to the west within the proposed car park. It will then discharge south along Newells road before discharging into an existing Anglian Water foul water asset.

Formal consent from the Anglian Water will need to be sought under Section 106 once planning permission has been granted, prior to construction.

APPENDIX A - EXISTING PUBLIC SEWER ASSET RECORD PLANS



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Date: 15/12/23

Scale: 1:1250

Map Centre: 523638,232043

Data updated: 30/11/23

Our Ref: 1347533 - 1

Wastewater Plan A4

This plan is provided by Anglian Water pursuant to its obligations under the Water Industry Act 1991 sections 198 or 199. It must be used in conjunction with any search results attached. The information on this plan is based on data currently recorded but position must be regarded as approximate. Service pipes, private sewers and drains are generally not shown. Users of this map are strongly advised to commission their own survey of the area shown on the plan before carrying out any works. The actual position of all apparatus MUST be established by trial holes. No liability whatsoever, including liability for negligence, is accepted by Anglian Water for any error or inaccuracy or omission, including the failure to accurately record, or record at all, the location of any water main, discharge pipe, sewer or disposal main or any item of apparatus. This information is valid for the date printed. This plan is produced by Anglian Water Services Limited (c) Crown copyright and database rights 2023 Ordnance Survey 100022432. This map is to be used for the purposes of viewing the location of Anglian Water plant only. Any other uses of the map data or further copies is not permitted. This notice is not intended to exclude or restrict liability for death or personal injury resulting from negligence.

Foul Sewer
Surface Sewer
Combined Sewer
Final Effluent
Rising Main*
Private Sewer*
Decommissioned Sewer*

Outfall*
Inlet*
Manhole*

Sewage Treatment Works

Public Pumping Station

Decommissioned Pumping Station

*(Colour denotes effluent type)

emily.smart@spd-studio.co.uk

MB018_Newells

love every drop
anglianwater



APPENDIX B - PROPOSED DEVELOPMENT SITE LAYOUT



KEY

Acoustic fence

PARKING SCHEDULE

No.	Type	
11	Unallocated + visitor space	P
14	Unallocated EV charging space	P
1	M4(2) + EV charging Space	P

SUMMARY:

21	Unallocated Spaces
5	Unallocated Visitor Spaces
TOTAL: 26 SPACES	
15	Cycle Parking Spaces

REFUSE TRACKING

Phoenix 2 Duo Recycler (P2-15W with Elite 6x4 chassis)

Overall Length	11.220m
Overall Width	2.530m
Overall Body Height	3.756m
Min Body Ground Clearance	0.309m
Track Width	2.530m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	11.550m

SWEPT PATH KEY

FORWARD WHEEL TRACK
FORWARD BODY CHASSIS
REVERSE WHEEL TRACK
REVERSE BODY CHASSIS

KEY PLAN

10 Updated landscaping EC JH 12.04.24

Rev.	Amendment	Drawn	Checked	Date
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SPDSTUDIO
SUSTAINABLE . PLANNING . DESIGN

RESIDENTIAL DEVELOPMENT

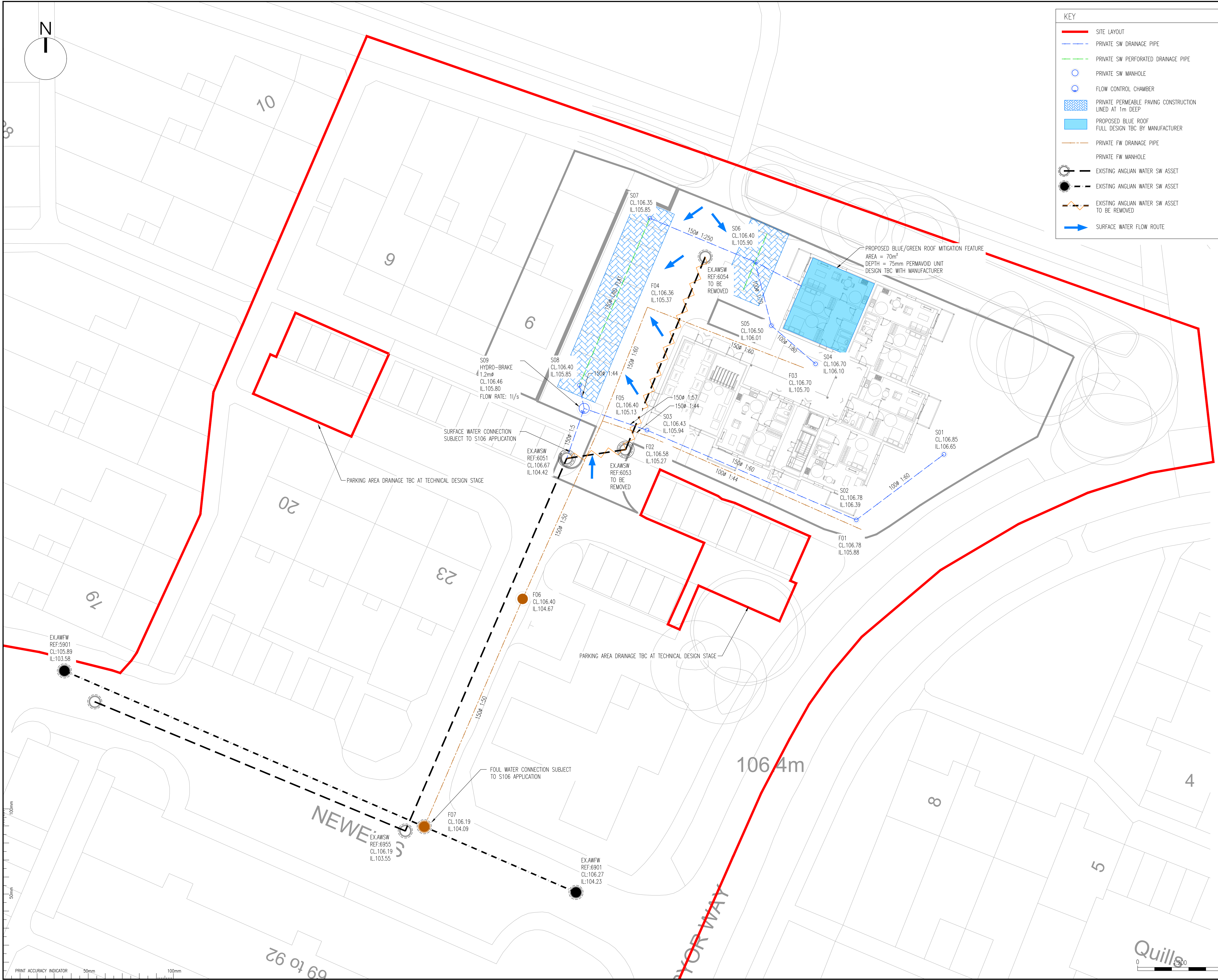
PROP SITE LAYOUT PLAN

SETTLE GROUP

NO. 3-5 NEWELLS
LETCHWORTH GARDEN CITY
SG6 2PH

MB018.300.10 1:200 @ A2 30.11.2023
WWW.SPD-STUDIO.CO.UK

APPENDIX C – DRAINAGE STRATEGY PLAN



KEY

- SITE LAYOUT
- PRIVATE SW DRAINAGE PIPE
- PRIVATE SW PERFORATED DRAINAGE PIPE
- PRIVATE SW MANHOLE
- FLOW CONTROL CHAMBER
- PRIVATE PERMEABLE PAVING CONSTRUCTION LINED AT 1m DEEP
- PROPOSED BLUE ROOF FULL DESIGN TBC BY MANUFACTURER
- PRIVATE FW DRAINAGE PIPE
- PRIVATE FW MANHOLE
- EXISTING ANGLIAN WATER SW ASSET
- EXISTING ANGLIAN WATER SW ASSET TO BE REMOVED
- SURFACE WATER FLOW ROUTE

GENERAL NOTES

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RELEVANT SPECIFICATION AND ALL OTHER RELATED DRAWINGS ISSUED BY THE ENGINEER.
- DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY.
- ALL DIMENSIONS SHOWN ON THIS DRAWING ARE IN METRES, UNLESS OTHERWISE STATED.
- NO DEVIATION FROM THE DETAILS SHOWN ON THIS DRAWING IS PERMITTED WITHOUT PRIOR PERMISSION FROM THE ENGINEER.
- ALL DIMENSIONS, LEVELS AND SURVEY GRID CO-ORDINATES ARE TO BE CHECKED ON SITE AND THE ENGINEER NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF THE WORKS.
- THE CONTRACTOR SHALL, BEFORE COMMENCING THE WORKS, VERIFY ALL SITE AND SETTING OUT DIMENSIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE TRUE AND PROPER SETTING OUT OF THE WORKS AND FOR THE CORRECTNESS OF THE POSITION, LEVELS, DIMENSIONS, AND ALIGNMENT OF ALL PARTS OF THE WORKS.
- THE CONTRACTOR SHALL UNDERTAKE SUCH MATERIALS TESTING AS INDICATED IN THE SPECIFICATIONS AND SHALL INCLUDE THE COST OF TESTING IN THE TENDER.
- ALL EXCAVATED MATERIAL WHERE NOT SUITABLE FOR REUSE SHALL BE DISPOSED OF AT AN APPROVED TIP OFF-SITE.

CDM NOTES

- THE ATTENTION OF THE CLIENT, PRINCIPAL DESIGNER, PRINCIPAL CONTRACTOR, DESIGNERS AND CONTRACTORS IS DRAWN TO THE FOLLOWING POTENTIAL RISKS IN CONJUNCTION WITH THE PROPOSED ON-SITE AND OFF-SITE WORKS AS DESIGNED FOR THIS PROJECT:
- WORKS IN THE VICINITY OF LIVE SERVICES INCLUDING GAS, ELECTRICITY AND BT WILL BE NECESSARY AND THE ADVICE OF ALL STATUTORY SERVICE COMPANIES MUST BE SOUGHT BEFORE ANY WORKS COMMENCE.
 - WORKS WITHIN AND ADJUTING THE EXISTING HIGHWAY WILL ENTAIL TRAFFIC HAZARDS AND ALL APPROPRIATE SAFETY MEASURES INCLUDING BARRIERS, SIGNS AND LIGHTING MUST BE UNDERTAKEN TO THE APPROVAL OF THE LOCAL AUTHORITY, THE HIGHWAY AUTHORITY AND THE POLICE DEPARTMENT.
 - HAZARDOUS MATERIALS INCLUDING CEMENT AND BITUMINOUS MATERIALS ARE SPECIFIED AND THE MANUFACTURERS ADVICE ON SAFE HANDLING PROCEDURES MUST BE OBTAINED AND MADE CLEAR TO ALL OPERATIVES.
 - THE CONTRACTOR WILL BE RESPONSIBLE FOR LOCATING ALL EXISTING SERVICES WITHIN THE VICINITY OF THE WORKS HAND DIG AND ENSURE THESE ARE PROTECTED THROUGHOUT THE DURATION OF THE WORKS. ALL UTILITY PLANT SHOULD BE CLEARLY MARKED ON THE GROUND PRIOR TO COMMENCEMENT OF THE WORKS.
 - THE CONTRACTOR MUST ENSURE ALL WORKING AREAS ARE FULLY SECURE.

DRAINAGE STRATEGY NOTES

- THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELATED ENGINEERS, ARCHITECTS & SUB-CONTRACTORS DRAWINGS. IN THE CASE OF DISCREPANCIES BETWEEN DRAWINGS REFER TO SPD STUDIO FOR CLARIFICATION.
- TOPOGRAPHICAL SURVEY UNDERTAKEN BY XXXXXX, DRAWING REF. XXXXXX DATED MONTH YYYY.
- THIS DRAWING IS BASED ON THE GROUND FLOOR SITE PLAN UNDERTAKEN BY XXXXXX, DRAWING REF. XXXXXX DATED MONTH YYYY.
- RAIN WATER PIPE & SOIL AND VENT PIPE LOCATIONS ARE TO BE CONFIRMED AT THE DETAILED DESIGN STAGE.
- ALL INVERT AND COVER LEVELS ARE TO BE CONFIRMED AT THE DETAILED DESIGN STAGE.
- PROPOSED FOUL WATER DRAINAGE CONNECTION TO ADAPTABLE SEWERS IS SUBJECT TO THE AGREEMENT OF ---INSERT SEWER AUTHORITY---
- PROPOSED SURFACE WATER DRAINAGE CONNECTION TO THE EXISTING DITCH/WATERCOURSE IS SUBJECT TO THE AGREEMENT OF THE LEAD LOCAL FLOOD AUTHORITY UNDER S23 OF THE LAND DRAINAGE ACT 1991.
- THIS LAYOUT INDICATES THE MAIN ADAPTABLE DRAINAGE RUNS FOR THE DEVELOPMENT. PRIVATE, BELOW GROUND DRAINAGE TO BE CONSIDERED AT DETAILED DESIGN STAGE.
- EXACT POSITION, TYPE AND NUMBER OF ABOVE GROUND DRAINAGE POINTS TO BE CONFIRMED BY ARCHITECT DURING THE DETAILED DESIGN STAGE. THEREFORE ALLOWANCES SHOULD BE MADE FOR INDIVIDUAL DRAINAGE CONNECTIONS.
- EXTERNAL LEVELS AT LEVEL THRESHOLDS TO BE DESIGNED TO HAVE SUFFICIENT FALL AWAY FROM STRUCTURE TO OMIT THE NEED FOR THRESHOLD DRAINS.
- FOOTWAYS AND PATIO AREAS TO BE LAID TO FALL TO SOFT LANDSCAPED AREAS. LANDSCAPED AREAS TO BE NO HIGHER THAN ADJACENT HARD STANDING AREAS.
- FINISHED FLOOR LEVELS TO BE TYPICALLY 150mm ABOVE EXISTING SITE LEVELS.

DRAINAGE STRATEGY DESIGN CRITERIA:

- PRELIMINARY SURFACE WATER ATTENUATION SIMULATIONS HAVE IDENTIFIED A POTENTIAL STORAGE REQUIREMENT OF 310-402m³ TO ACCOMMODATE A 1:100 YEAR RAINFALL EVENT (INCLUDING AN ADDITIONAL 40% FOR ANY POTENTIAL CLIMATE CHANGE IMPACT) BASED ON THE FOLLOWING DESIGN PARAMETERS:
MS-60mm = 21,000mm
RATIO, R = 0.431
IMPERMEABLE AREA = 0.428 HECTARES
1:100yr (+40%) DISCHARGE RATE = 1.3 l/s
- THE SURFACE WATER DETAILS ILLUSTRATED ON THIS PLAN ARE SUBJECT TO HYDRAULIC MODELING DURING THE DETAILED DESIGN STAGE TO ESTABLISH THE PEAK WATER LEVEL ASSOCIATED WITH A 1:100 YEAR RAINFALL EVENT (INCLUDING CLIMATE CHANGE).

WORK IN PROGRESS

REV	DESCRIPTION	DATE	APPV'D	DRAWN
P02	UPDATED SITE LAYOUT	06/09/24	GW	GW
P01	FIRST ISSUE	JNR	GW	JNR

SPDSTUDIO
SUSTAINABLE PLANNING DESIGN

Unit 12 Tollgate Business Park, Colchester, CO3 8AB
T. 01206 265 224 | E. info@spd-studio.co.uk | W. www.spd-studio.co.uk

CLIENT
SETTLE GROUP

PROJECT TITLE
**3-5 NEWELLS,
LETCWORTH GARDEN CITY
SG6 2PH**

DRAWING TITLE
DRAINAGE STRATEGY

SCALE 1:200 @ A1	DRAWING STATUS PRELIMINARY
DRAWN BY LRL	CHECKED BY GW
APPROVED BY JNR	DATE APR/2024
DRAWING NO. MB018-E-300	REV P02



APPENDIX D – SURFACE WATER DRAINAGE SIMULATION OUTPUTS

Design Settings

Rainfall Methodology	FEH-13	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	40	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1			106.000	600	523662.788	232045.555	1.114
Carpark 1	0.078	5.00	106.000		523665.284	232048.663	1.000
2					523661.862	232039.922	
3			106.000	1200	523661.862	232039.922	1.277
4			106.000	1200	523660.809	232036.567	1.377

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	Carpark 1	1	3.986	0.600	105.000	104.886	0.114	35.0	150	5.04	50.0
1.001	1	3	5.709	0.600	104.886	104.723	0.163	35.0	150	5.09	50.0
1.002	3	4	3.516	0.600	104.723	104.623	0.100	35.0	150	5.13	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.707	30.2	19.7	0.850	0.964	0.078	0.0	89	1.819
1.001	1.707	30.2	19.7	0.964	1.127	0.078	0.0	89	1.819
1.002	1.707	30.2	19.7	1.127	1.227	0.078	0.0	89	1.819

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
1	523662.788	232045.555	106.000	1.114	600		1	1.000	104.886	150
							0	1.001	104.886	150
Carpark 1	523665.284	232048.663	106.000	1.000			0	1.000	105.000	150
2	523661.862	232039.922								
3	523661.862	232039.922	106.000	1.277	1200		1	1.001	104.723	150
							0	1.002	104.723	150
4	523660.809	232036.567	106.000	1.377	1200		1	1.002	104.623	150

Simulation Settings

Rainfall Methodology	FSR	Summer CV	0.750	Drain Down Time (mins)	1140
FSR Region	England and Wales	Winter CV	0.840	Additional Storage (m³/ha)	0.0
M5-60 (mm)	20.000	Analysis Speed	Normal	Check Discharge Rate(s)	x
Ratio-R	0.400	Skip Steady State	x	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440
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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0	100	0	0	0
30	0	0	0	100	40	0	0

Node 3 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	1.002	Sump Available	✓
Replaces Downstream Link	✓	Product Number	CTL-SHE-0046-1000-1100-1000
Invert Level (m)	104.723	Min Outlet Diameter (m)	0.075
Design Depth (m)	1.100	Min Node Diameter (mm)	1200
Design Flow (l/s)	1.0		

Node Carpark 1 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	105.000	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	368	Depth (m)	1.000
Safety Factor	5.0	Width (m)	15.900	Inf Depth (m)	
Porosity	0.30	Length (m)	10.000		

Other (defaults)

Entry Loss (manhole)	0.250	Entry Loss (junction)	0.000	Apply Recommended Losses	x
Exit Loss (manhole)	0.250	Exit Loss (junction)	0.000	Flood Risk (m)	0.300

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